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## CRYPTODISCUS, HALL.

IN a recent paper in this JOURNAL,<sup>1</sup> I figured and described some peculiar disk-like fossils from the Niagara limestone at Joliet, Ill., identifying them with Hall's genus *Cryptodiscus*, and interpreting them as the possible casts of the gastric cavities of Medusæ. At the time these descriptions were written a part of the material had been in my hands for two years or more. As the paper was going to press, too late for revision, additional material which suggested an entirely different interpretation, came into my hands from the collection of Mr. E. E. Teller, of Milwaukee, Wis. These new specimens are from the dolomitic Niagara limestone of Racine, Wis., and like the others are casts, the actual substance of the fossil being dissolved out. This new material shows that the disk-like bodies are not the complete fossils, but that they are attached to the summit of a tube composed of regularly arranged plates.

The disk portion of the fossil, to which Hall gave the name *Cryptodiscus*, was fully described in my former paper. It consists of an expanded disk with a variously lobed periphery, composed of four equal plates which occupy the position of the four quadrants of the disk. Figure 1, Plate A, and Fig. 6, Plate B represent the impressions of the lower and upper sides of a very complete specimen from Racine. It is similar to the specimen to which the name *Cryptodiscus digitatus* was given in my former paper, but differs from that species in the lobing of the periphery. If broken off at the bottoms of the lobes it would have the contour of *C. hydei*. The lower side of the disk with its central funnel-shaped depression with the central elevation is not different from those formerly described, but the upper side of the specimen is more nearly perfect than any of those. It is

<sup>1</sup> "On the Presence of Problematic Fossil Medusæ in the Niagara Limestone of Northern Illinois."—JOUR. GEOL., Vol. V, p. 744.

flat across the central portion with the exception of a small square fractured area in the exact center. This fractured portion corresponds to a similar fractured area at the summit of the central prominence of the lower side, and really represents a perforation through the disk in its perfect condition.

The impression of the upper side of the disk of another species is seen in Fig. 4, Plate A. The lobing of the periphery is different in this species, but its greatest peculiarity is in the presence of the impressions of four rather slender diverging spines, one on each quadrant, surrounding the fracture representing the central perforation of the disk.

In the limestone at Racine, associated with *Cryptodiscus*, the internal casts of some peculiar tubelike bodies have been found by Mr. Teller. Two views of the most perfect of these specimens are shown on Plate A, Fig. 3, and Plate B, Fig. 7. The tubes are composed of plates arranged in ranges of four each, and in the specimen illustrated the impressions of three such ranges are preserved. The top range consists of two longer plates and two shorter ones; the middle range consists of two plates below the shorter plates of the top range, which are placed higher than the two plates below the longer plates of the top. The lower ends of the basal range of plates are not preserved, but the summits are alternately higher and lower, to correspond with the plates of the middle range.

The specimen which forms the connecting link between the disk and the tube is illustrated on Plate A, Fig. 2. In this specimen the disk and the tube are both incomplete, but the relative position of the two is perfectly shown. The four quadrants of the disk are shown to be but the greatly expanded margins of the four plates in the top range of the tube, and the central elevation seen in the impressions of the lower side of the disk, is the summit of the internal cast of the tube.

When the relationship of the disk to the tube was recognized, the crinoidal character of *Cryptodiscus* could not be questioned; and a comparison of the arrangement of the plates in the tube with the arrangement of the plates in the dome of *Calli crinus*,

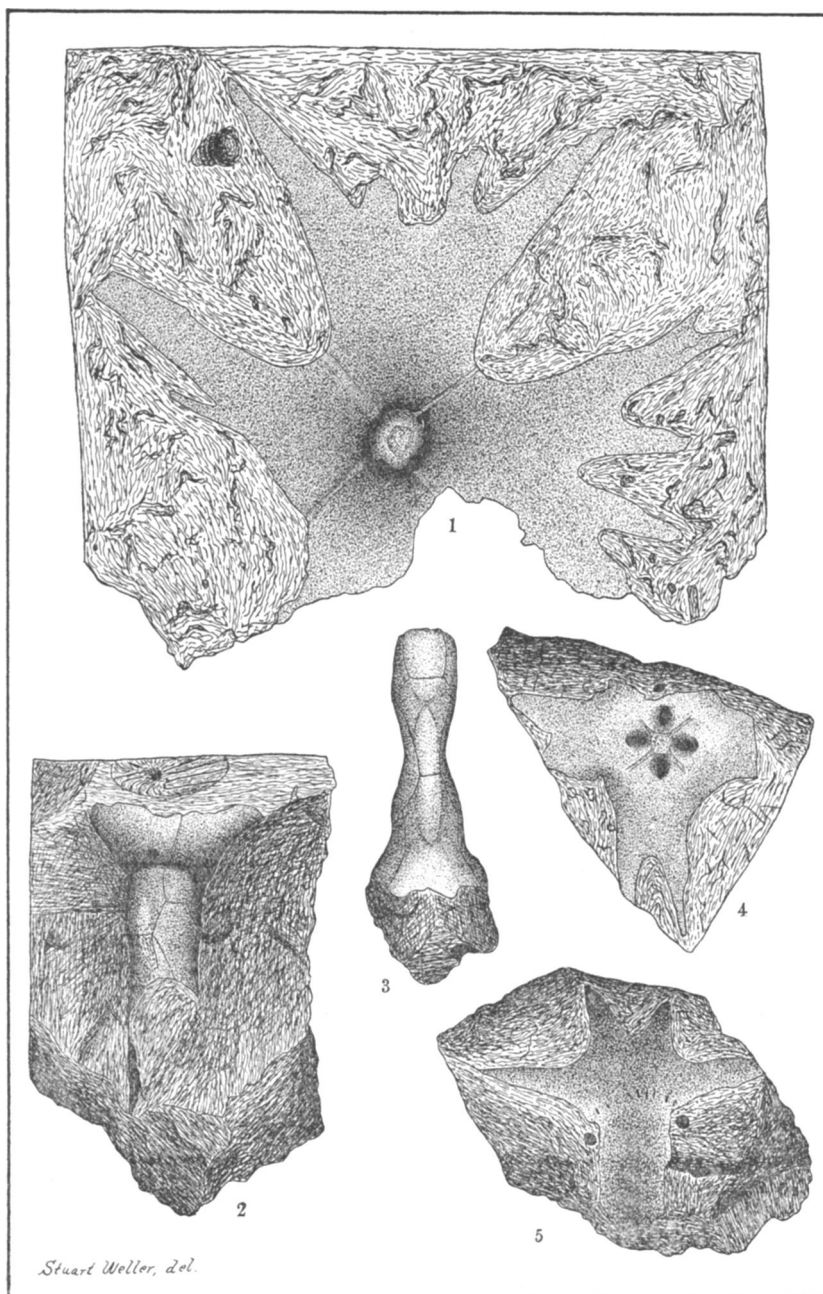


PLATE A

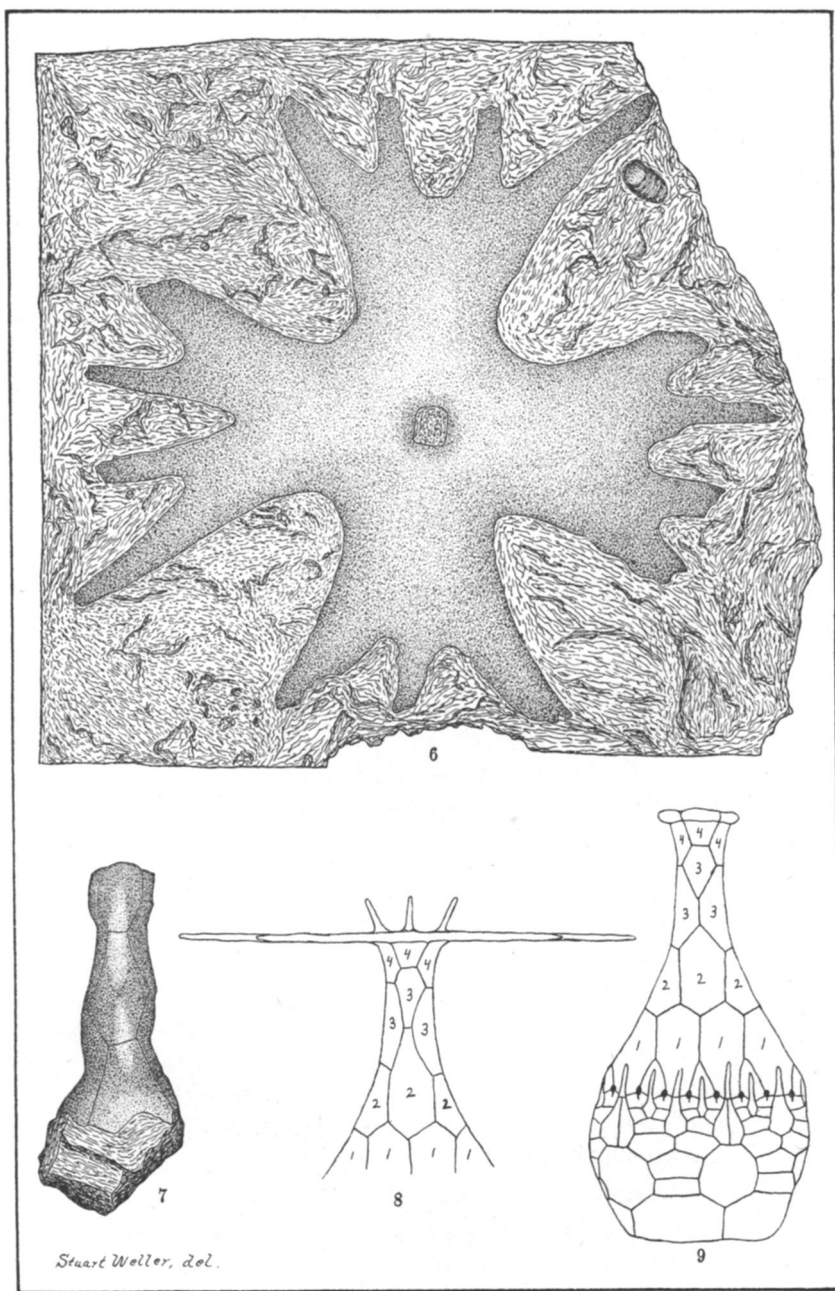


PLATE B

showed *Cryptodiscus* to be but a portion of the dome of members of that genus.

Figure 9, Plate B, is a diagram adapted from Wachsmuth and Springer, to show the arrangement of the plates in the calyx of *Callicrinus costatus* His., the type of the genus. The dome is composed of four ranges of plates, of which the first contains ten, and the second, third, and fourth ranges, four plates each.

Figure 8, Plate B, shows diagrammatically the arrangement of the plates in the Racine specimen. The three ranges of plates present in these specimens correspond to the second, third, and fourth ranges in the dome of *C. costatus*. The plates in the Racine specimens differ from those of *C. costatus* in the third range; the two lower plates of this range are not in contact laterally, as in that species, but are separated by the downward extension of the two upper plates, which meet the truncated upper ends of the two corresponding plates of the second range. The most conspicuous difference between the Racine specimens and *C. costatus*, is in the greatly expanded margins of the plates of the fourth range, forming the disk to which the name *Cryptodiscus* has been applied.

Figure 5, Plate A, which shows the external impression of a portion of a disk attached to the tube, is introduced to show a peculiar ring-like canal which surrounds the tube just below its junction with the disk. This canal is open entirely around the tube so far as it is preserved, and a pliable wire inserted at one side passes around and out on the opposite side. On the impression itself, just above the angle between the disk and the tube, is a series of small slit-like openings which apparently connect with the ring canal. In the actual specimens, of course, these openings were represented by a solid ring around the tube, which was supported by a series of small bars connected with the basal portion of the under side of the disk. No explanation of these characters can be offered.

In their monograph, "The North American Crinoidea Camerata," Wachsmuth and Springer recognize from the dorsal cups alone, four species of *Callicrinus*—*C. beachleri* from St. Paul,

Ind., *C. acanthus* from Lockport, N. Y., *C. cornutus* from Racine, Wis., and Chicago, Ill., and *C. ramifer* from Tennessee. From the St. Paul beds in which *C. beachleri* occurs, Miller<sup>1</sup> has figured a specimen of *Cryptodiscus*. From the Racine beds, associated with *C. cornutus* the specimens illustrated in this paper were obtained. From Lockport, N. Y., and from Tennessee there is as yet no record of *Cryptodiscus*, but specimens may yet be found in these localities. The known localities for *Cryptodiscus* are Racine, Wis., Joliet, Ill., St. Paul, Ind., and Jones county, Ia., and in all these, with the exception of the last, the dorsal cups of *Callicrinus* are found associated with it.

The correlation of *Cryptodiscus* as a genus with *Callicrinus* seems complete, but material has not yet been found by means of which the species of *Cryptodiscus* may be correlated with the species of *Callicrinus* described from the dorsal cup.

The genus *Cryptodiscus*, founded by Hall, was never properly described, nor were the relationships of the fossils to which the name was applied, properly understood. D'Orbigny's name, *Callicrinus*, also has priority over Hall's, so it becomes necessary to drop *Cryptodiscus* entirely, and to refer all the specimens to *Callicrinus*. The different forms of disks doubtless represent distinct species of the genus, but there may be a difference of opinion as to whether species should be established upon the disk alone without a knowledge of the dorsal cup, and no names will be given to the Racine specimens for the present.

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<sup>1</sup> Eighteenth Rep. Dep. Geol. and Nat. Rec., Indiana, p. 260, Pl. I, Fig. 7.